



2003 AFCEE Technology Transfer Workshop

San Antonio, Texas

Promoting Readiness through Environmental Stewardship

Interstate Technology & Regulatory Council

Alternative Landfill Technologies

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What Is ITRC?

ITRC Is A Unique Forum

- **We produce products focused on implementation at the working level – where the regulator interfaces with the regulated community.**
- **We take responsibility to implement the products.**
- **We focus on solutions.**
- **The process matters. Teams become the forum for creating technical capacity, identifying areas of consensus, and building a network of trust.**

Promoting Readiness through Environmental Stewardship



Participants

- State Regulators
- Public Stakeholders
- Academia
- Federal Agencies
- Industry Representatives
- Co-Sponsors



U.S. Department of Energy



U.S. Environmental
Protection Agency



U.S. Department of Defense



Environmental
Council of the States



Western Governors'
Association

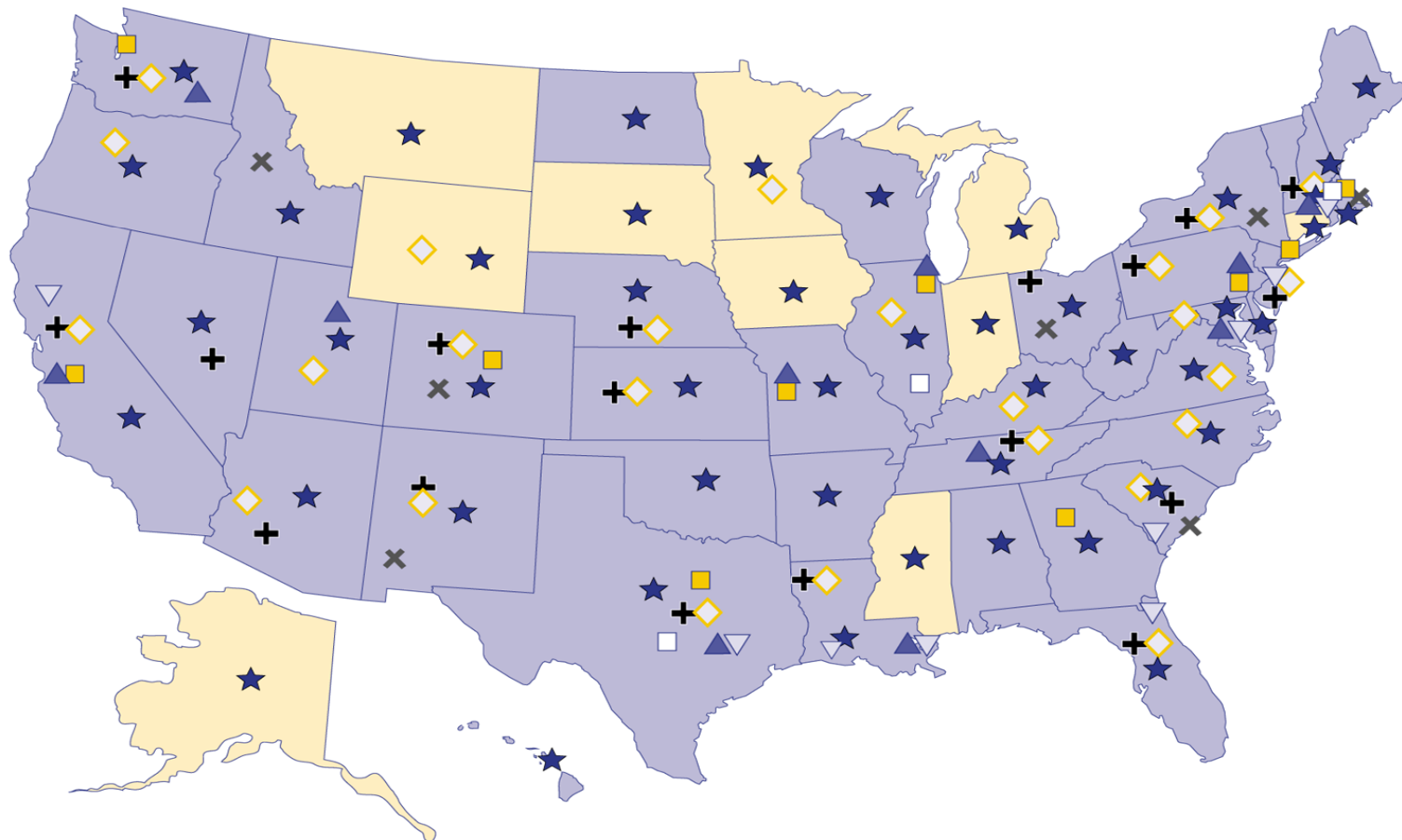


Southern States
Energy Board

Promoting Readiness through Environmental Stewardship



Nationwide Success



December 2001

■ Active ITRC States (40 plus DC)

★ Students Trained

⊕ Product Use at a Site

◇ Institutional Success

⊗ ITRC Network Success

▲ Natural Attenuation Training Course

▽ Accelerated In Situ Bioremediation Training Course

■ Permeable Reactive Barriers Training Course

□ Phytotechnologies Training Course

Promoting Readiness through Environmental Stewardship



Making A Measurable Impact

- Of The 10,000 Plus People Who Have Participated In ITRC Classroom And Internet Training –
 - ◆ 87% Of Those Surveyed Indicated,

“The information provided in the course/document is very useful to me and will result in time or cost savings.”



Alternative Landfill Technologies

- **Publish the Alternative Landfill Covers Case Studies Document**
- **Complete Questionnaire to the 44 ITRC States**
- **Drafting and Finalize the Alternative Landfill Covers Technical/ Regulatory Guidance Document**
- **Implement internet training for the Alternative Landfill Cover Guidance Document**

Promoting Readiness through Environmental Stewardship



Alternative Landfill Technologies

- **Alternative Landfill Covers Guidance Document**
 - **Scope: Solid Waste, Hazardous Waste, Mixed Waste**
 - **Identify regulatory requirements and barriers**
 - Work with decision makers impacting regulations
Industry, DOD, DOE, EPA, States,
 - Review existing regulations and applicable guidance
- **Identify opportunities for regulatory flexibility**



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- **Translate the regulatory flexibility into landfill design and construction guidance**
- **Integrate the landfill design and construction aspects into long term operation and maintenance criteria**



Alternative Landfill Technologies

- Regulatory Flexibility - Fact or Fiction
 - Federal Hazardous Waste Regulations (RCRA)
 - Over 71% of authorized states polled by the ITRC adopted the following federal regulation allowing department managers the flexibility to implement alternative design and operating landfill requirements
- § 264.301 Design and operating requirements.
- (b) The owner or operator will be exempted from the requirements of paragraph (a) of this section if the Regional Administrator finds, based on a demonstration by the owner or operator, that alternative design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituents (see § 264.93) into the ground water or surface water at any future time. In deciding whether to grant an exemption, the Regional Administrator will consider:



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- The Federal Hazardous Waste Regulations (40 CFR) state in Section 264.110(c) pertaining to Closure and Post-Closure Standards that:
 - (c) The Regional Administrator may replace all or part of the requirements of this subpart (and the unit-specific standards referenced in § 264.111(c) applying to a regulated unit), with alternative requirements set out in a permit or in an enforceable document (as defined in 40 CFR 270.1(c)(7)), where the Regional Administrator determines that:
 - (2) It is not necessary to apply the closure requirements of this subpart (and those referenced herein) because the alternative requirements will protect human health and the environment and will satisfy the closure performance standard of § 264.111 (a) and (b).



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■ Federal Solid Waste Regulatory Flexibility

§ 258.60 Closure criteria.

(b) The Director of an approved State may approve an alternative final cover design that includes:

- (1) An infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in paragraphs (a)(1) and (a)(2) of this section, and
- (2) An erosion layer that provides equivalent protection from wind and water erosion as the erosion layer specified in paragraph (a)(3) of this section.



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- Applied Regulatory Flexibility
 - Hazardous Waste Alternative Landfill Cover Waste Demonstration Projects (7)
 - Arkansas
 - Colorado
 - New Hampshire
 - New Mexico
 - Texas
 - Utah
 - Wisconsin



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- Solid Waste Alternative Landfill Cover Demonstration Projects (18)
 - Arkansas
 - California
 - Colorado
 - Florida
 - Georgia
 - Hawaii
 - Illinois
 - Indiana
 - Kansas
 - Maryland
 - Michigan
 - Missouri
 - Montana
 - Nebraska
 - Ohio
 - Oregon
 - Virginia
 - Washington



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- Mixed Waste Alternative Landfill Cover Demonstration Projects (8)
 - Idaho
 - Kentucky
 - Maryland
 - Nevada
 - New Mexico
 - New York
 - Texas
 - Washington



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- Solid Waste Alternative Landfill Cover Full Scale Projects
 - California
 - Colorado
 - Delaware
 - Michigan
 - Nebraska
 - Ohio
 - Oregon
 - Pennsylvania
 - Tennessee



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- ITRC Technical/ Regulatory Guidance document
 - Regulatory Barriers
 - Acceptance and Implementation
 - Alternative Landfill Cover Design
 - Design Goals
 - Protection of Human Health and the Environment
 - Site Characterization
 - Modeling
 - Construction
 - Construction materials
 - Construction Methods
 - QA/QC
 - Post-Closure Care



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- Percent of States Using the Following Design Criteria

	Hazardous	Solid
■ Flux Through the Cover	100%	75%
■ Total Leachate Collection	67%	75%
■ Liner Leakage Rate	67%	87%
■ Groundwater Monitoring	33%	37%



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- Do states consider site characteristics to establish landfill performance requirements?
 - Yes 78%
 - No 22%



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- Have states approved the full scale operation of a landfill without the construction and evaluation of a test pad or modeling results?
 - Yes 71%
 - No 29%

- Solid Waste 60%
- Hazardous Waste 54%
- Municipal Waste 20%
- Industrial Waste 0%



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- ITRC Tech/Reg Guidance Document Path Forward
 - Finalize Guidance Document: Fall 2003
 - Initiate Internet Training: Spring 2004



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- Future ITRC Alternative Landfill Technology Projects
 - Bioreactors
 - Post-Closure Care